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INTER - OFFICE CORRESPONDENCE

Richmond, Virginia

To: Mr. J. E. Wickham Date: January 24, 1990
From: R. A. Thesing
Subject: Accomplishments 1989 - Cigarette & Tobacco Properties Section

Attached are the accomplishments for the Cigarette and Tobacco Properties Section. A summary of the accomplishments for 1989 are given below.

I. SPECIAL INVESTIGATIONS AND METHODS DEVELOPMENT

A. Dynamic RTD/Ventilation

To establish a procedure for measuring RTD and ventilation as cigarettes are smoked.

Results: An evaluation of the instrument indicates that it will provide requestors with reproducible results on a per-puff basis for dynamic RTD and ventilation. The instrument is currently available for dynamic measurement of various cigarette design models and filter types. This equipment should aid filter development, cigarette technology and product development personnel in the design/performance characteristics of new or existing models.

B. Firmness

1. Objective: Support the collaborative testing between various PM laboratories.

Results:

- a. Comparative testing between PM Richmond and FTR showed that a difference of approximately 0.2 mm still exists between the two laboratories. ISO conditions at FTR yielded consistently lower (firmer) values than samples tested at ISO conditions in Richmond. Measurements of tobacco bed temperature revealed that FTR's results were 3-3.5°F lower than those in Richmond. A strong directional correlation between tobacco temperature and firmness exists. Further testing is planned.
- b. Completed an evaluation of the firmness instruments using five different cigarette brands and testing at various relative humidity levels.

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- c. Participated in a firmness collaborative study with Pierre Soquel of FTR. The testing was conducted on cigarettes from Switzerland at two condition levels (FTC and ISO).
- d. Additionally, Jean-Pierre Mussini and Marcel Hugenin of FTR were in Richmond to test a strain gauge calibrator for the firmness instruments. At that time, firmness testing was conducted on two cigarette brands at two condition levels (FTC and ISO) and on two firmness instruments (R&D and FTR).

2. Objective: To establish a calibration standard via silicone or other suitable material with three (3) different firmness values (3.5, 3.0, 2.5 mm).

Results: A calibration standard was requested which would be reproducible over a 6-12 month period. Currently, there are standards available which show reproducible results over a three month period. Testing will continue between R&D and QA.

C. Peak Coal Temperature

Objective: To assist Ms. B. Joyner in her efforts to assemble hardware, understand the software and bring the Agema Thermovision instrument on-line.

Results: Successfully assisted Ms. Barbara Joyner with the assembling of the hardware of the Agema Thermovision System, mastering of the specific software needs, and total integration of the system to the needs of CTSD.

D. Borgwaldt Cylinder Volume Instrument

Objective: To evaluate commercially available instruments, develop testing procedures and analyze new methods of cigarette testing in order to increase test efficiency, improve accuracy or replace obsolete instrumentation.

Results: The re-engineered (prototype) cylinder volume instrument, manufactured by Borgwaldt, was being evaluated by the Standards Laboratory of Quality Engineering. A comparison study between the existing instrument and the prototype instrument using Marlboro filler was performed by the Physical Testing Laboratory. The study showed the results were comparable.

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E. Citrate in Cigarette Paper

Objective: To develop an ion chromatographic procedure for separating and quantifying citric acid.

Results: The procedure was verified using IC from selected brands of known citrate level. The results agree with the GC (gas chromatographic) method. The procedure has been passed to the Analytical Chemistry Section of CTSD. A method for CTSD's use has been submitted to the Methods Committee.

F. Industry Monitor #13

Objective: Coordinate the production, equilibrating and canning of the industry monitor.

Results:

- (1) 3.2 million monitor cigarettes were canned during a four day, two shift operation in June. This monitor had a firmness of 2.78 mm with 98% of the product at ± 25 mg of target weight.
- (2) Approximately 850 cigarette magazines were stored on special shelving which was fabricated to accommodate the cigarettes for the equilibration period. Laboratory conditions were closely monitored with wet bulb/dry bulb psychrometers, and circulating fans were installed to maintain uniform airflow within the laboratory. Necessary instruments were temporarily set up in other laboratories to maintain workflow of priority samples during this period of approximately eight weeks.

G. Miscellaneous Investigations

Extruded tobacco filaments in RJR's Best Value generic products
Menthol cigarette filter holder - Japan
RJR's Premier Smokeless product
Microscopic examination of RJR cigarette papers
Cigarette papers on Marlboro cigarettes worldwide

II. LABORATORY AUTOMATION

Physical Testing Robotic Test Station

Objective: To provide support to the Development Engineering Division during design and assembly of the robotic test station. This support included development involvement, understanding of robotic capabilities and knowledge of instrumentation. The robot will be capable of testing cigarette circumference, total resistance-to-draw, filter resistance-to-draw, ventilation, cigarette length and filter length. This test station will be able to handle 85% of the various samples tested.

Results: The robotic test station was delivered in November. The system was debugged and fine tuned. Comparative studies will follow.

III. PUBLICATIONS, PRESENTATIONS, REPORTS

A. Video Lab Procedures

Objective: Liaison between Training Center and Laboratories. Coordinate schedules, personnel, shooting, viewing tapes and manuscripts. Edit/revise procedures as needed.

Results: The video for the oven volatiles procedure was completed during the third quarter. This completes the fourth video of laboratory procedures.

B. Pictorial Diary

Objective: Photograph all new brands and package changes. Update annually the pictorial diaries distributed throughout R&D and New York Office.

Results: Photos of all new brands and package changes were added to the twenty pictorial diaries which are distributed throughout R&D and the New York Office. Completed first quarter.

Target: First Quarter - Completed

C. Annual Investigation of Reconstituted Tobacco

Objective: Investigate each major manufacturer's reconstituted tobacco annually. Prepare written report.

- A. Microscopic
- B. Physical
- C. Chemical

Results: Reconstituted tobaccos from Philip Morris and competitor's brands was microscopically examined for material content and type of process. Brown & Williamson was the only manufacturer that made a change in their reconstituted tobacco since these materials were examined in 1988.

Brown & Williamson uses three types of reconstituted tobacco. Two are made by the papermaking process and the third is an "RCB type" cast sheet. This "RCB type" sheet material is mixed in a 50/50 ratio with the "RL type" sheet in only Viceroy 85 and 100 cigarettes. The "RCB type" sheet contains diamonium phosphate (DAP) as indicated by the levels of soluble ammonia (0.69%), phosphorus (2.10%) and the high total alkaloid content.

Target: Fourth Quarter - Completed

D. Consolidated Report

Objective: To collect domestic brand samples for cigarette firmness, cylinder volume, coal removal and ventilation characteristics analyses. To evaluate data and summarize these data in an annual report.

To train the supervisor of the Materials Evaluation Laboratory to assume the cigarette firmness and cylinder volume responsibilities for this project, and to train the supervisor of the Microscopy Laboratory to assume the coal removal and ventilation characteristics responsibilities for this project. These responsibilities include collection of samples, data evaluation, updating of RS1 files and summation of results.

Results: Collection of samples were submitted for cigarette firmness, cylinder volume, coal removal and ventilation characteristics analyses on a monthly basis. All brands are tested once a quarter. This year, however, R. J. Reynolds brands were tested more frequently to determine any changes in these parameters due to the decrease in tobacco weight in most of their brands.

Training of personnel assuming responsibilities for this project began during the last quarter of 1989, and will continue into 1990.

RAT:rad

Attachments

Richard A. Thy

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